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[54] **PROCESS FOR PRODUCING POLYMERS USEFUL IN THERMOSET COATINGS AND POLYMER SO PRODUCED**

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[58] **Field of Search** 528/323, 326, 354, 359, 528/370, 392, 393

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[57] **ABSTRACT**

A polymerization process to produce polyol polymer useful in the formulation of thermoset coatings, including the polymer so produced, is disclosed. The polymers are characterized as having at least one main chain and a plurality of side chains attached thereto. The polymerization process comprises combining in a solvent, at an elevated temperature and for a predetermined period of time, an addition-polymerizable monomer (that is also a free-radical initiator) together with an ethylenically-unsaturated monomer (having a nucleophilic or an electrophilic moiety), to initiate addition copolymerization of the addition-polymerizable monomer with the ethylenically-unsaturated monomer, whereby propagation of the reaction forms the main chain of the polymer. Meanwhile, also combined in the solvent is a polymerizable, carbonyl carbon-containing, ringed molecule—such as a lactone—which, at the elevated temperature, has a ring portion that opens to initiate ionic-copolymerization (of the now-opened ring molecule) with the nucleophilic-containing or electrophilic-containing moiety, whereby propagation of this reaction forms the side chains of the polyol polymer. Termination of the addition-copolymerization and ionic-copolymerization reactions is effected when the polyol polymer attains a predetermined number-average and/or weight-average molecular weight. The polymerization process is characterized in that each of the main-chain and side-chain propagations occurs substantially simultaneously, relative to the other, without using a catalyst.

17 Claims, No Drawings